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QUARTERLY BULLETIN

ELECTRICAL INSPECTION BRANCH

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We wish to apologize for the very small printing used in the last issue of the Bulletin. Since the material is photographed and developed in reduced dimensions, so that it may be accommodated in the present booklet form, it is necessary that the original typing be done on forms of comparable size to those of the booklet. This was unfortunately overlooked during the preparation of the last issue but our readers may be assured that such an oversight will not be repeated.

REVISED RULE 6-040 (a)

A number of inquiries have recently been received regarding interpretation of the above rule with respect to the requirements for two spare circuits in rural installations and small residences.

Rule 6-040 is applicable only to those installations in which "a single service box" has been omitted. Since either a main service breaker or a main switch constitutes a "single service box", those installations provided with a main service breaker or switch are not covered by this rule.

Farm installations are always provided with a main service breaker on the transformer pole and therefore we would not be concerned with either the number of branch circuit breakers installed, or the provision of accommodation for spare circuits, in any of the farm buildings. This would apply to the farm residence as well as to the remaining buildings.

With regard to the requirements for space for two additional circuits in very small residences (two or three rooms), it is felt that if such buildings are the usual type of residential occupancy, as distinct from motels, etc., it would be advisable to ask for such space. Buildings of this type frequently require additional circuits and it is felt that the spare accommodation (not the circuit breakers) can be provided at a very slight additional cost. In the case of motels, or similar occupancies, however, the provision of extra space is not considered as important since the connection of extra heaters or heavy appliances does not usually constitute a problem in such places.

SEPARATELY METERED OCCUPANCIES

In the above types of occupancies (for example, residences with a rented basement suite) a separate circuit-breaker panel may be installed off each meter. Each panel must have space

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for one spare circuit breaker and the combined total of breaker handles in the two panels must not exceed the limitation imposed if only one panel is used. I. e. the maximum allowable number of circuit breakers would be ten plus a range breaker. For example, a residence with a basement suite may be supplied with a panel which will accommodate eight breakers for the main part of the residence and another panel which will accommodate four breakers for the basement. This would only be acceptable if the main part of the residence required only seven circuits and the basement suite only three circuits at the time of installation, thus leaving space for one additional circuit in each panel.

In no case will more than two separate housings for circuit breakers be permitted without the provision of a main service switch or circuit breaker and it is only when two meters are installed that even two separate enclosures may be provided for the circuit breakers.

THERMOPLASTIC INSULATED CONDUCTORS OF MORE THAN ONE SIZE IN A CONDUIT

Table 5-A, recently adopted and published by the Electrical Inspection Branch of Alberta for thermoplastic insulated conductors of one size only in conduit, is based on the allowable percentages of conduit fill as given in the bottom line of Table 8 of the Sixth Edition of the Canadian Electrical Code. The cross-sectional areas of the conductors were taken, in all cases, as those of conducdtors having rubber insulation, as required by Rule 4-016 (2) (b) of the Sixth Edition of the Canadian Electrical Code.

When thermoplastic insulated conductors of more than one size are to be run in conduit, the size of conduit required should be determined as outlined above. That is, the total cross-sectional area of conductors should be calculated on the basis of rubber insulation and the allowable percentage conduit fill determined by reference to the bottom line of Table 8 in the Code.

TYPE OF WIRING REQUIRED IN SCHOOLS AND HOTELS

Schools of more than three classrooms must be wired in conduit or equivalent, according to Rule 12-200 (1) (d) of the Sixth Edition of the Canadian Electrical Code.

However, the Alberta Regulations Governing Interior and Farm Wiring, clause 32 (a), allows schools of not more than four rooms to be wired in non-metallic sheathed cable if there is not more than one floor above ground level and if no single room exceeds 1500 sq. feet in area. For schools of frame construction, this is the regulation which will be followed by the Provincial Inspection Department.

When a small school, of four rooms or less, is being originally wired, consideration should be given to the possibility of future additions to the building. If the original wiring is in non-metallic sheathed cable but rooms are added later to bring the total number to five or more, the complete building would require rewiring in conduit or equivalent.

In general, the wiring in hotels must be governed by Rule 12-200 of the Sixth Edition of the Code, which requires conduit to be installed throughout. However, in the case of hotels of frame construction, located in hamlets or villages and having not more than twenty guest rooms, the Alberta Inspection Branch is prepared to accept conduit or equivalent in the basement and on the first floor but non-metallic sheathed cable on other floors.

RULE 4-006 - SIXTH EDITION OF THE CANADIAN ELECTRICAL CODE

The above Rule requires de-rating of the current-carrying capacities of conductors when more than three conductors are installed in a raceway or when more than three conductors are run in cable form.

It is to be noted that a neutral conductor which carries only the unbalanced current from other conductors is not to be considered when determining the necessity for de-rating of the current-carrying capacities. For a three-phase, four-wire system, with three circuit conductors and the neutral run in one conduit, no de-rating would be required. Similarly, if three sets of three-wire branch circuits were installed in one conduit, with each set using a common neutral, the current-carrying capacities of the conductors would require de-rating to 80% of the capacities given in Table 2 of the Code, rather than to 70%, since the three neutral conductors carry only the unbalanced current from the other conductors.

In general, Rule 4-006 is to be applied to feeders, sub-feeders and branch circuit conductors as distinct from runs consisting solely of control conductors. If a conduit contained more than three conductors and only a portion were control conductors, the control conductors should be ignored as far as determining the necessity for de-rating is concerned.

LOAD LIMITING DEVICES

Devices which are designed to automatically disconnect a less-preferred heavy load when one of higher priority is turned on, have recently appeared on the market.

These devices, in their present form, are not acceptable to this Department since installations in which they are installed on the load side of the branch circuit protection do not conform to Rule 26-090 of the Sixth Edition of the Canadian Electrical Code.

The device may be used in installations provided with a main service switch, if it is connected between the main switch and the branch-circuit protection and if separate overcurrent protection and disconnecting means are installed in the line to the less-preferred load.

SEWAGE DISPOSAL PLANTS

Due to the wide variation in the conditions found in sewage disposal plants, it is impossible to give specific requirements as to the type of electrical equipment that may be required in any particular plant.

In general, electrical control equipment should not be installed in portions of the plant in which the atmospheres may be damp or corrosive and it may even be necessary, in some cases, to mount the service and control equipment outside in a weatherproof enclosure. This general principle is indicated in Rule 22-006 of the Sixth Edition of the Canadian Electrical Code and Section 22 as a whole may be referred to for guidance when an installation of this nature is contemplated.

It must be emphasized that the atmosphere in a sewage disposal plant may be of a far more hazardous nature than damp or corrosive. This condition is governed by the quantity of gases present, the ventilation provided, etc., and in some instances it may be necessary to provide explosion-proof equipment.

Before proceeding with such installations, details should be discussed with the Electrical Inspection Branch.

In general, electrical equipment in portions of the plant in which the atmosphere may be damp or corrosive should be limited to that which is absolutely essential. Services and control equipment must be installed in a dry location and, if such a location is not available inside the building, may require enclosing in a weather-proof cabinet outside. Any electrical equipment which must be installed in damp or corrosive atmospheres must be vapour-proof or explosion-proof, depending on the conditions encountered.

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For information purposes, telephone numbers of personnel in the Edmonton Electrical Inspection Office are listed below:

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ELECTRICAL INSPECTION OFFICE

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